



State of Utah

GARY R. HERBERT  
*Governor*

GREG BELL  
*Lieutenant Governor*

Department of  
Environmental Quality

Amanda Smith  
*Executive Director*

DIVISION OF WATER QUALITY  
Walter L. Baker, P.E.  
*Director*

**MEMORANDUM**

**TO:** Water Quality Board

**THROUGH:** Walter L. Baker, P.E., Director

**FROM:** Michael D. Allred,  
Watershed Protection Section

**DATE:** June 12, 2013

**SUBJECT:** Introduction of Colorado River Selenium Total Maximum Daily Load Study

The Division of Water Quality is preparing a Total Maximum Daily Load (TMDL) for selenium in the Colorado River. The study is being completed internally by the Division of Water Quality. Local stakeholders from the Moab Area Watershed Partnership are serving as the Advisory Committee for the TMDL.

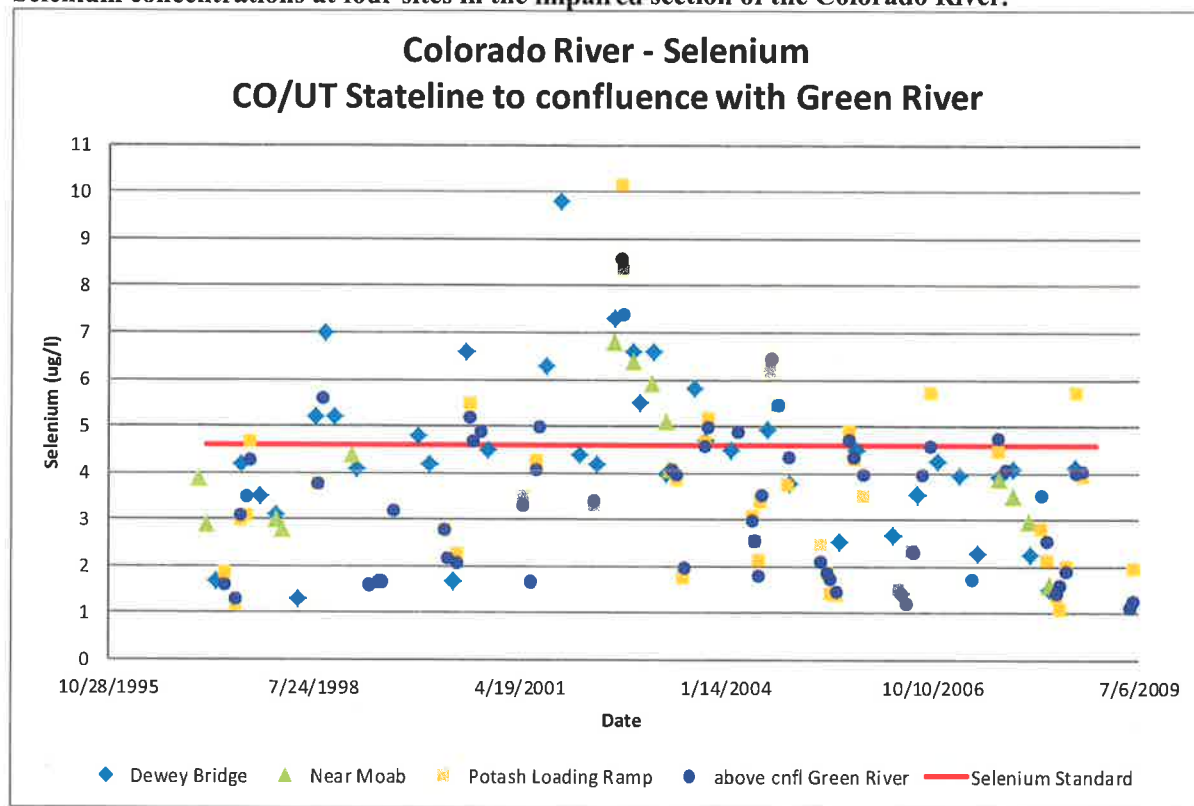
**Colorado River TMDL**

The Colorado River was originally listed on Utah's 2006 303(d) list for impairment to its warm water fishery beneficial use (3B) due to excess concentrations of selenium that exceed Utah's chronic standard for selenium of 4.6 µg/l.

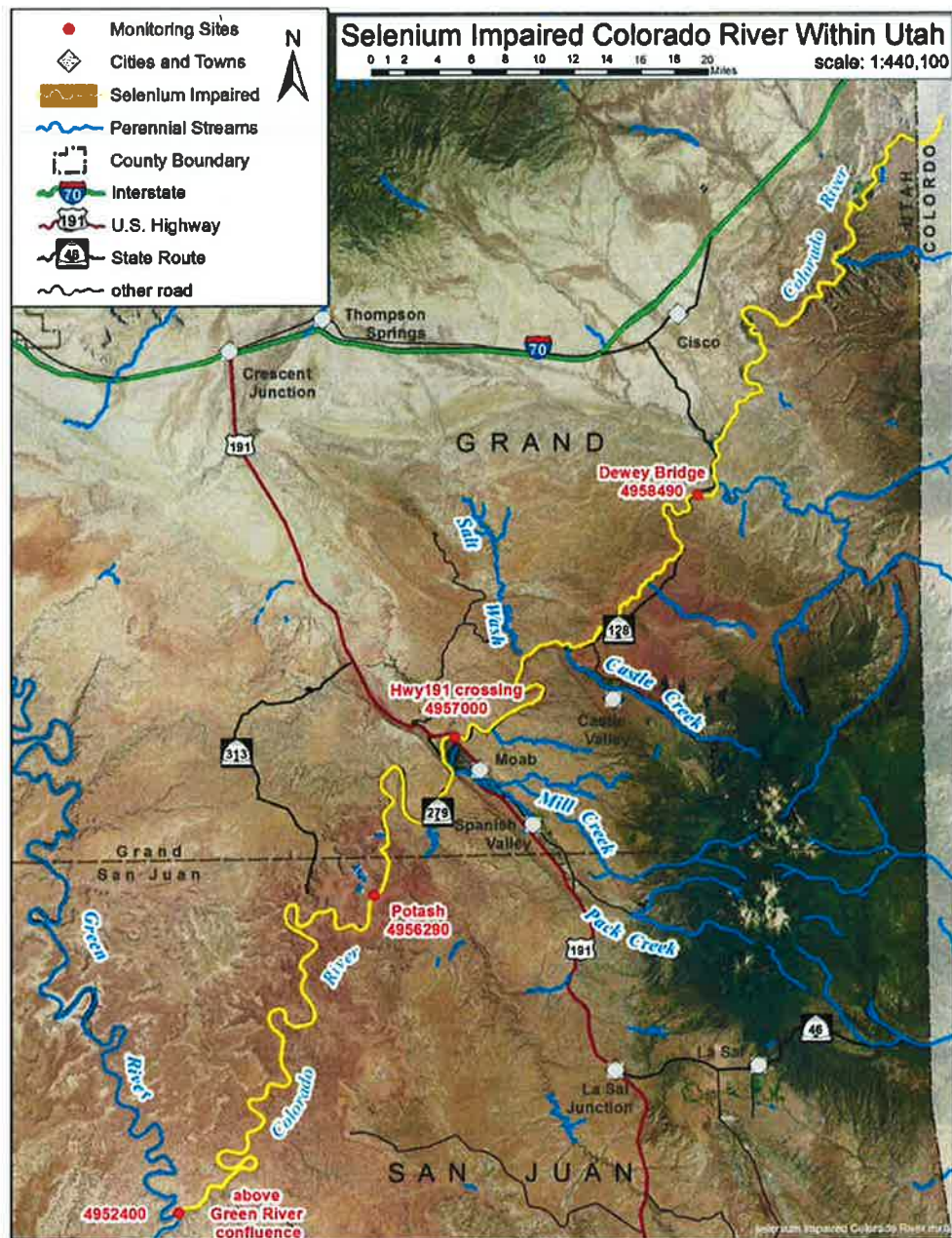
The State is concerned with high levels of selenium due to a high incidence of mortality, deformities, and decreased reproduction in fish and aquatic birds. Selenium is also hypothesized by the USGS as contributing to the decline of endangered fish species within the upper Colorado River Basin because it may inhibit reproduction and recruitment.

Selenium exists naturally in the Mancos Shale derived soils common to the Colorado River Basin. Studies suggest that selenium mobilization occurs primarily in shallow aquifers, which are present as a result of irrigation and water delivery through unlined canal networks. Water in shallow aquifers is a diffuse source of return flows to tributaries and the Colorado River, thus making it difficult to pin point where major loading sources of selenium occur. Irrigation is widespread in the Grand Valley basin which has been noted to concentrate selenium when irrigation waters evaporate and concentrate the dissolved components.

**Selenium concentrations at four sites in the impaired section of the Colorado River.**

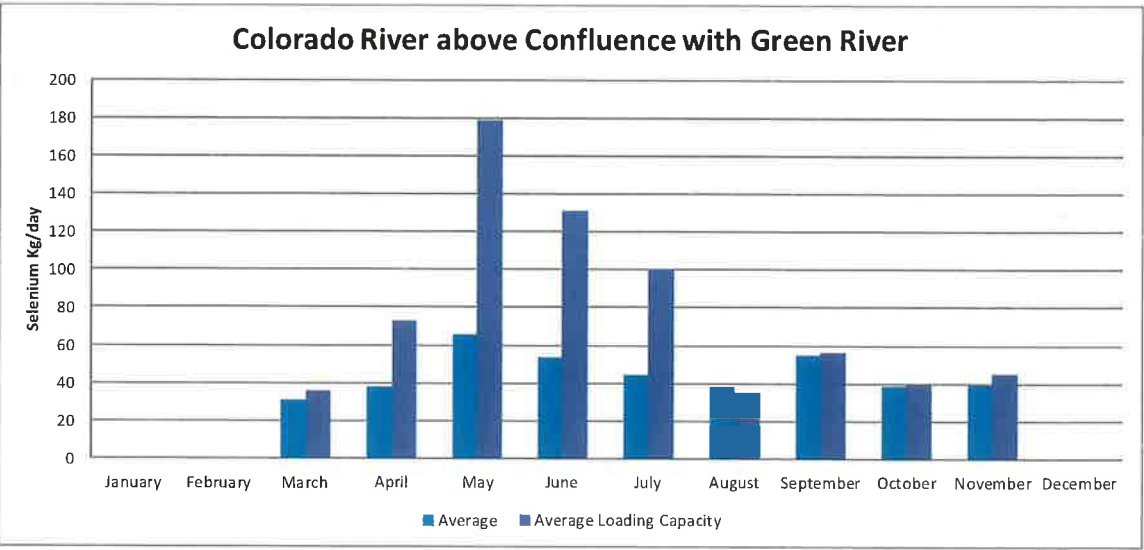
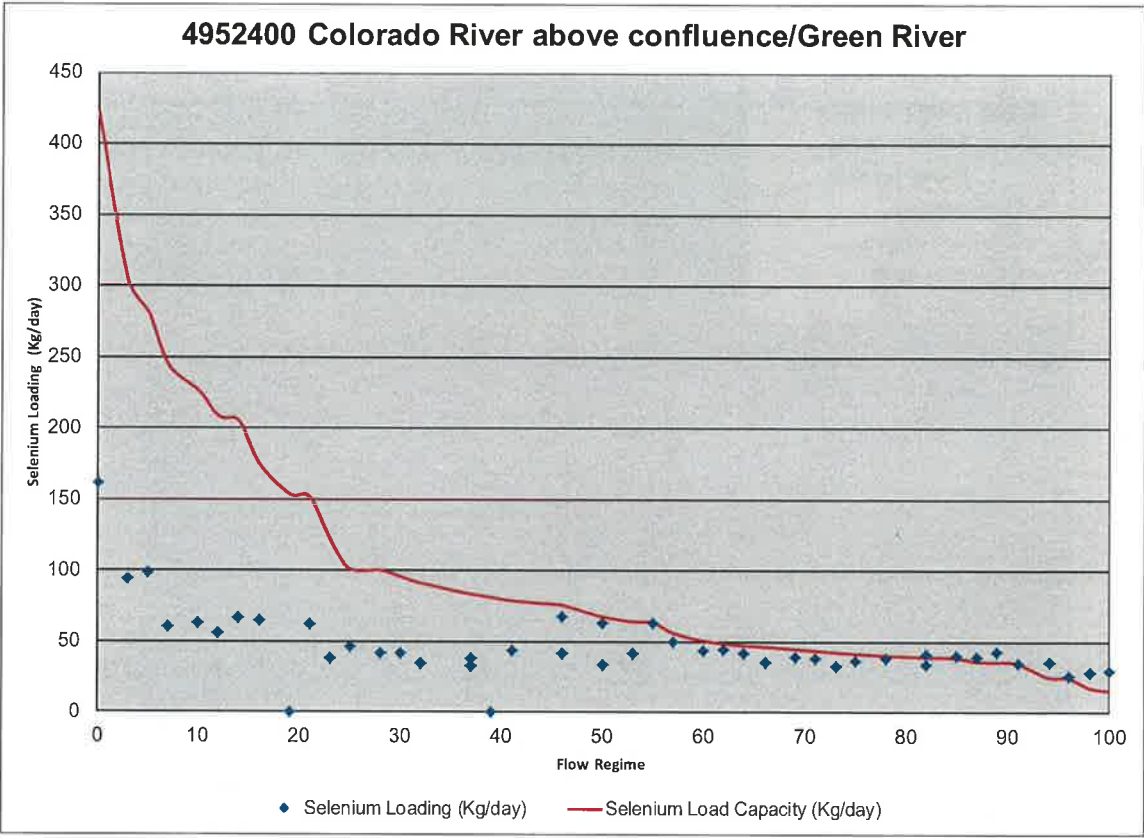


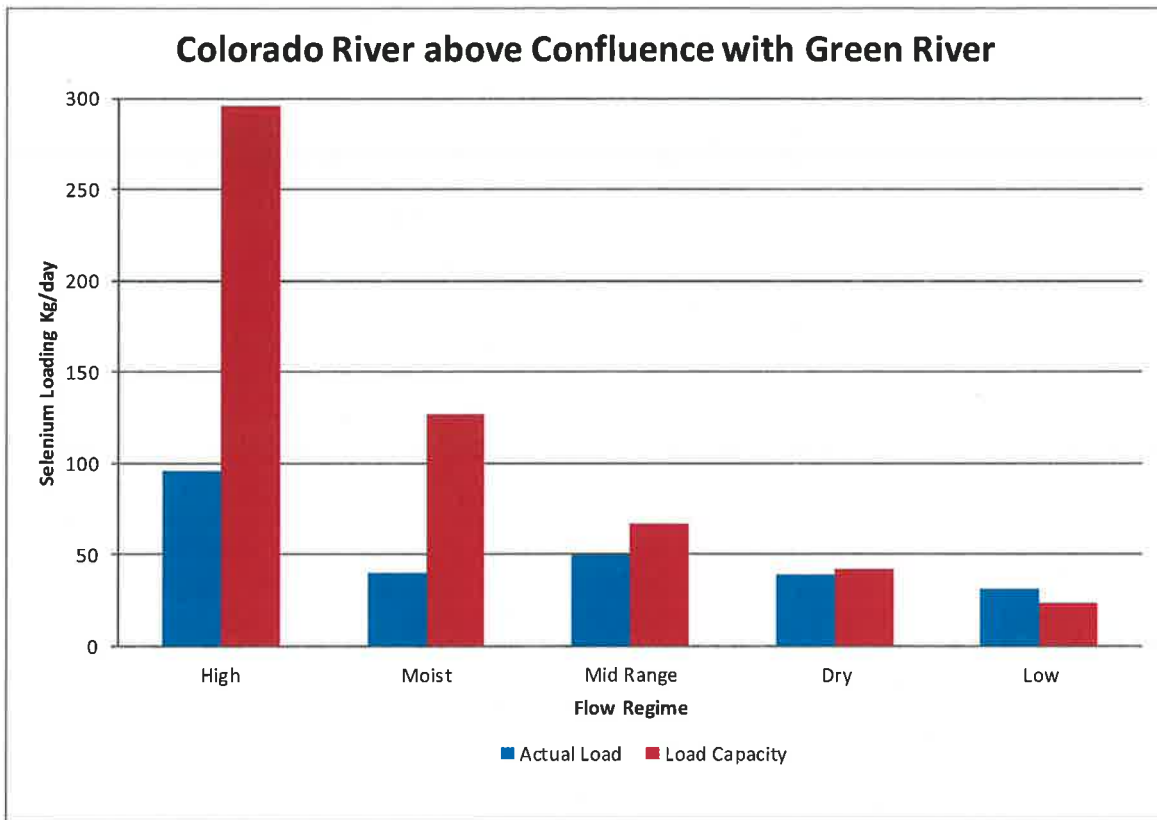
The predominant land manager in the basin is the BLM. The Forest Service also manages a large tract of land in the LaSal Mountains. Private land is mostly located in Spanish Valley and Castle Valley.



Agriculture within the drainage occurs primarily along the Mill Creek/Pack Creek tributary and the Castle Creek tributary. Selenium concentrations in the two tributaries are well below the state standard.

The two charts below clearly shows that the selenium problem in the Colorado River is seasonal and occurs in predominately low flow conditions in August.





In the above chart the loading capacity is compared to the actual load associated with the flow regime. The only category in which the actual load exceeds the capacity is in the low flow regime, where 90% of the time these flows are exceeded.

Because there is limited agriculture in the Utah portion of the basin and the impairment occurs during low flow the sources of pollutant loads in Utah are primarily from natural background sources. The reasonable assurance that the TMDL endpoints will be achieved is that implementation is currently ongoing under the cooperative efforts of agricultural producers within the Upper Colorado River watershed and the Colorado River Basin Salinity Control Program.

#### **Schedule**

WQ Board presentation 6/26  
 Close of public comment on 7/26  
 August WQ Board petition for approval and rulemaking 8/28  
 Close of rulemaking comment period 9/28  
 Submit TMDL to EPA

